

AD-A075 346

ARMY INDUSTRIAL BASE ENGINEERING ACTIVITY ROCK ISLAND IL F/G 13/8
MANUFACTURING METHODS AND TECHNOLOGY CAM PLAN FY 1979-1981.(U)
AUG 79 J H SULLIVAN

UNCLASSIFIED

NL

| OF |
ADA
075346

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40	41	42	43	44	45
46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100	101	102	103	104	105
106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
121	122	123	124	125	126	127	128	129	130	131	132	133	134	135
136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160	161	162	163	164	165
166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
181	182	183	184	185	186	187	188	189	190	191	192	193	194	195
196	197	198	199	200	201	202	203	204	205	206	207	208	209	210
211	212	213	214	215	216	217	218	219	220	221	222	223	224	225
226	227	228	229	230	231	232	233	234	235	236	237	238	239	240
241	242	243	244	245	246	247	248	249	250	251	252	253	254	255
256	257	258	259	260	261	262	263	264	265	266	267	268	269	270
271	272	273	274	275	276	277	278	279	280	281	282	283	284	285
286	287	288	289	290	291	292	293	294	295	296	297	298	299	300
301	302	303	304	305	306	307	308	309	310	311	312	313	314	315
316	317	318	319	320	321	322	323	324	325	326	327	328	329	330
331	332	333	334	335	336	337	338	339	340	341	342	343	344	345
346	347	348	349	350	351	352	353	354	355	356	357	358	359	360
361	362	363	364	365	366	367	368	369	370	371	372	373	374	375
376	377	378	379	380	381	382	383	384	385	386	387	388	389	390
391	392	393	394	395	396	397	398	399	400	401	402	403	404	405
406	407	408	409	410	411	412	413	414	415	416	417	418	419	420
421	422	423	424	425	426	427	428	429	430	431	432	433	434	435
436	437	438	439	440	441	442	443	444	445	446	447	448	449	450
451	452	453	454	455	456	457	458	459	460	461	462	463	464	465
466	467	468	469	470	471	472	473	474	475	476	477	478	479	480
481	482	483	484	485	486	487	488	489	490	491	492	493	494	495
496	497	498	499	500	501	502	503	504	505	506	507	508	509	510
511	512	513	514	515	516	517	518	519	520	521	522	523	524	525
526	527	528	529	530	531	532	533	534	535	536	537	538	539	540
541	542	543	544	545	546	547	548	549	550	551	552	553	554	555
556	557	558	559	560	561	562	563	564	565	566	567	568	569	570
571	572	573	574	575	576	577	578	579	580	581	582	583	584	585
586	587	588	589	590	591	592	593	594	595	596	597	598	599	600
601	602	603	604	605	606	607	608	609	610	611	612	613	614	615
616	617	618	619	620	621	622	623	624	625	626	627	628	629	630
631	632	633	634	635	636	637	638	639	640	641	642	643	644	645
646	647	648	649	650	651	652	653	654	655	656	657	658	659	660
661	662	663	664	665	666	667	668	669	670	671	672	673	674	675
676	677	678	679	680	681	682	683	684	685	686	687	688	689	690
691	692	693	694	695	696	697	698	699	700	701	702	703	704	705
706	707	708	709	710	711	712	713	714	715	716	717	718	719	720
721	722	723	724	725	726	727	728	729	730	731	732	733	734	735
736	737	738	739	740	741	742	743	744	745	746	747	748	749	750
751	752	753	754	755	756	757	758	759	760	761	762	763	764	765
766	767	768	769	770	771	772	773	774	775	776	777	778	779	780
781	782	783	784	785	786	787	788	789	790	791	792	793	794	795
796	797	798	799	800	801	802	803	804	805	806	807	808	809	810
811	812	813	814	815	816	817	818	819	820	821	822	823	824	825
826	827	828	829	830	831	832	833	834	835	836	837	838	839	840
841	842	843	844	845	846	847	848	849	850	851	852	853	854	855
856	857	858	859	860	861	862	863	864	865	866	867	868	869	870
871	872	873	874	875	876	877	878	879	880	881	882	883	884	885
886	887	888	889	890	891	892	893	894	895	896	897	898	899	900
901	902	903	904	905	906	907	908	909	910	911	912	913	914	915
916	917	918	919	920	921	922	923	924	925	926	927	928	929	930
931	932	933	934	935	936	937	938	939	940	941	942	943	944	945
946	947	948	949	950	951	952	953	954	955	956	957	958	959	960
961	962	963	964	965	966	967	968	969	970	971	972	973	974	975
976	977	978	979	980	981	982	983	984	985	986	987	988	989	990
991	992	993	994	995	996	997	998	999	1000	1001	1002	1003	1004	1005
1006	1007	1008	1009	1010	1011	1012	1013	1014	1015	1016	1017	1018	1019	1020
1021	1022	1023	1024	1025	1026	1027	1028	1029	1030	1031	1032	1033	1034	1035
1036	1037	1038	1039	1040	1041	1042	1043	1044	1045	1046	1047	1048	1049	1050
1051	1052	1053	1054	1055	1056	1057	1058	1059	1060	1061	1062	1063	1064	1065
1066	1067	1068	1069	1070	1071	1072	1073	1074	1075	1076	1077	1078	1079	1080
1081	1082	1083	1084	1085	1086	1087	1088	1089	1090	1091	1092	1093	1094	1095
1096	1097	1098	1099	1100	1101	1102	1103	1104	1105	1106	1107	1108	1109	1110
1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122	1123	1124	1125
1126	1127	1128	1129	1130	1131	1132	1133	1134	1135	1136	1137	1138	1139	1140
1141	1142	1143	1144	1145	1146	1147	1148	1149	1150	1151	1152	1153	1154	1155
1156	1157	1158	1159	1160	1161	1162	1163	1164	1165	1166	1167	1168	1169	1170
1171	1172	1173	1174	1175	1176	1177	1178	1179	1180	1181	1182	1183	1184	1185
1186	1187	1188	1189	1190	1191	1192	1193	1194	1195	1196	1197	1198	1199	1200
1201	1202	1203	1204	1205	1206	1207	1208	1209	1210	1211	1212	1213	1214	1215
1216	1217	1218	1219	1220	1221	1222	1223	1224	1225	1226	1227	1228	1229	1230
1231	1232	1233	1234	1235	1236	1237	1238	1239	1240	1241	1242	1243	1244	1245
1246	1247	1248	1249	1250	1251	1252	1253	1254	1255	1256	1257	1258	1259	1260
1261	1262	1263	1264	1265	1266	1267	1268	1269	1270	1271	1272	1273	1274	1275
1276	1277	1278	1279	1280	1281	1282	1283	1284	1285	1286	1287	1288	1289	1290
1291	1292	1293	1294	1295	1296	1297	1298	1299	1300	1301	1302	1303	1304	1305
1306	1307	1308	1309	1310	1311	1312	1313	1314	1315	1316	1317	1318	1319	1320
1321	1322	1323	1324	1325	1326	1327	1328	1329	1330	1331	1332	1333	1334	1335
1336	1337	1338	1339	1340	1341	1342	1343	1344	1345	1346	1347	1348	1349	1350
1351	1352	1353	1354	1355	1356	1357	1358	1359	1360	1361	1362	1363	1364	1365
1366	1367	1368	1369	1370	1371	1372	1373	1374	1375	1376	1377	1378	1379	1380
1381	1382	1383	1384	1385	1386	1387	1388	1389	1390	1391	1392	1393	1394	1395
1396	1397	1398	1399	1400	1401	1402	1403	1404	1405	1406	1407	1408	1409	1410
1411	1412	1413	1414	1415	1416	1417	1418	1419	1420	1421	1422	1423	1424	1425
1														

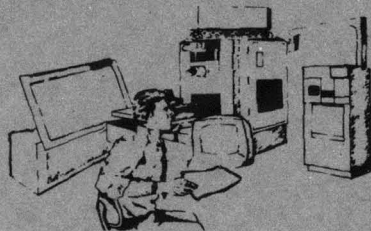
ADA075346

LEVEL

U.S. ARMY

MATERIEL DEVELOPMENT
AND READINESS COMMAND

42



MANUFACTURING
METHODS &
TECHNOLOGY

DDC
RECEIVED
OCT 19 1979
E

CAM PLAN

FY 79-81

~~RCS: DRCMT-304~~

FILE COPY

DISTRIBUTION UNLIMITED DOCUMENT FOR PUBLIC RELEASE.

PREPARED BY

AUGUST 1979

USA INDUSTRIAL BASE ENGINEERING ACTIVITY

MANUFACTURING TECHNOLOGY DIVISION

ROCK ISLAND, ILLINOIS 61299

79 10 19 179

~~NONE~~
SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER RCS: DRCMT-304	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) Manufacturing Methods and Technology CAM Plan FY 79-81	5. TYPE OF REPORT & PERIOD COVERED Final rept., FINAL FY 79-81	6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) JAMES H. SULLIVAN	8. CONTRACT OR GRANT NUMBER(s) 1	
9. PERFORMING ORGANIZATION NAME AND ADDRESS U. S. Army Industrial Base Engineering Activity Attn: DRXIB-MT Rock Island, IL 61299	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 12 46	
11. CONTROLLING OFFICE NAME AND ADDRESS U. S. Army Materiel Development and Readiness Command Attn: DRCMT Alexandria, VA	12. REPORT DATE August 1979	
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)	13. NUMBER OF PAGES 54	
	15. SECURITY CLASS. (of this report) None	
16. DISTRIBUTION STATEMENT (of this Report) Distributed unlimited, document for public release.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Computer Aided Manufacturing Computer Aided Design CAD/CAM Technology Manufacturing Technology		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) This report provides a summary of the Army's FY 79-81 Manufacturing Methods and Technology Program directed toward computer-aided manufacturing. The following information is provided for 61 projects. Project number, title, projected funding, a statement of the problem and proposed solution, and the technology area into which the project is categorized. The current status of FY 79 projects is also provided.		

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)



DEPARTMENT OF THE ARMY
US ARMY INDUSTRIAL BASE ENGINEERING ACTIVITY
ROCK ISLAND, ILLINOIS 61299

5 SEP 1979

DRXIB

SUBJECT: CAM Plan

SEE DISTRIBUTION

1. Inclosed for your information is the Army CAM Plan for FY79-81. This plan, published in accordance with DARCOM Regulation No. 15-13, provides a comprehensive picture of where DARCOM plans to invest MMT funds on CAM technology. Lists and summaries of the individual CAM related projects submitted by various DARCOM organizations are provided.
2. This Plan is one of the initiatives being taken by IBEA and the Office of Manufacturing Technology to take advantage of CAM technology in a more systematic manner. Coordination with other DARCOM organizations on this program will be carried out by means of the DARCOM Computer Aided Manufacturing Steering Group.
3. Questions regarding the contents of this report should be directed to Mr. Jim Sullivan, US Army Industrial Base Engineering Activity, Rock Island Arsenal, IL 61299; AV 793-6172, commercial (309) 794-6172.

1 Incl
as


JAMES W. CARSTENS

Acting Director
Industrial Base Engineering Activity

Accession For	
MMIS GMA&I	<input checked="checked" type="checkbox"/>
DIC TAB	<input type="checkbox"/>
Unannounced	<input type="checkbox"/>
Justification	
By	
Distribution/	
Availability Codes	
Dist	Availand/or special
A	

DISCLAIMER

- The data provided within this report is provided for planning and discussion purposes only and not as information usable in pricing or contracting for the work.
- The projects listed and the dollar amounts shown are subject to change without notice.

TABLE OF CONTENTS

	<u>page</u>
Introduction	1
Summary	2
CAM Project Information	
FY 79	3
FY 80	12
FY 81	18
Appendicies	
CAM Technology Areas	A1
Summary Charts	B1
Project Index	C1
Distribution List	D1

INTRODUCTION

This report contains a listing of the active FY79 and planned FY80-81 CAM related MMT projects. Data presented on each project includes the project number, title, projected funding, a statement of the problem and proposed solution, and the technology area into which the project is categorized. The current status of FY79 projects is also provided. Information is presented in three sections, one for each year, FY79, FY80, and FY81. Within each section projects are grouped according to technology areas. A description of these technology areas is provided in Appendix A. Summary charts and an index relating projects to commands responsible for project execution are included at Appendix B and C respectively.

SUMMARY

- The CAM Plan identifies the 61 Manufacturing Methods and Technology (MMT) projects planned for funding by DARCOM in fiscal years 1979, 1980, and 1981. The proposed funding for those years is:

FY79	\$8.3 Million
FY80	5.3
FY81	8.9

- The projects are also identified by ten technical areas. The technical areas proposed for the greatest funding are:

<u>Technical Area</u>	<u>FY79</u>	<u>FY80</u>	<u>FY81</u>
Fabrication	\$3.0M	\$1.4M	\$2.8M
CAD/CAM Interaction	1.2M	0.1M	2.5M
Manufacturing Control	0.9M	2.2M	2.4M
Test, Inspection & Evaluation	1.6M	0.8M	0.3M

- The DARCOM Major Subordinate Commands which have proposed the largest CAM Programs for the three years are:

ARRCOM/ARRADCOM	\$8.1 Million
TARADCOM	4.0
ERADCOM	3.2
MICOM	2.9
CORADCOM	2.8
AVRADCOM	1.6

FISCAL YEAR
79
CAM RELATED
MM & T
PROJECTS

ARMY CAD/CAM PROJECTS
08/31/79

*** PROJ NUMBER TITLE PROJ COST
*** 5 79 6736 TECH READINESS ACCEL THRU COMPUTER INTEGRATED MFG (CAO) 256
*** PROBLEM SOLUTION TECHNOLOGY AREA
*** THE LEAD TIME REQUIRED TO BRING PRODUCTION LINES THE DEVELOPMENT AND IMPLEMENTATION OF A COMPUTER I
TO MOBILIZATION MAXIMUM IS INTOLERABLY EXCESSIVE. NTEGRATED MANUFACTURING SYSTEM WILL SIGNIFICANTLY
A CRITICAL DETERMENT IS THE EXTREME SHORTAGE OF REDUCE THE REQUIREMENT FOR HIGHLY SKILLED CRAFTSMEN.
TOOLMAKERS AND MACHINISTS.
*** WORK STATUS
*** PROCUREMENT PACKAGE WAS PREPARED TO DESIGN AND DEVELOP AN ARCHITECTURE FOR COMPUTER INTEGRATED MANUFACTURE OF AMMUNITION METAL PARTS WITH REDUCED LEAD TIME. PROCEDURES AND DOCUMENTATION ARE BEING PREPARED FOR PRODUCTION TOOLING.

*** PROJ NUMBER TITLE PROJ COST
*** 1 79 7183 SEMI-AUTO COMPOSITE MFG SYS-HELICOPTER FUSELAGE STRUCTURES 100
*** PROBLEM SOLUTION TECHNOLOGY AREA
*** HELICOPTER FUSELAGE STRUCTURES HAVE HIGH MANUFACTURE AND DEMONSTRATE A SEMI-AUTOMATED COMPOSITE MANUFACTURING SYSTEM FOR THE PRODUCTION OF COMPOSITE HELICOPTER FUSELAGE STRUCTURAL PARTS.
URING COST DUE TO HIGH PART COUNT AND HIGH ASSEMBLY COSTS. METHODS OF COMPOSITE FABRICATION HAVE BEEN INVESTIGATED BUT HAND OPERATIONS RESULT IN HIGH LABOR COSTS.
*** WORK STATUS
*** DELINQUENT STATUS REPORT *****

*** PROJ NUMBER TITLE PROJ COST
*** 5 79 4124 FABRICATION OF CONTROL ACTUATION SYSTEM HOUSINGS 930
*** PROBLEM SOLUTION TECHNOLOGY AREA
*** THE HOUSINGS USED IN TACTICAL WEAPONS CONTROL SYSTEMS PROVIDE A COMPUTER NUMERICAL CONTROL (CNC) MULTIMENSION CENTER CAPABILITY TO PRODUCE THESE HOUSINGS AT AN ANNUAL RATE OF 12,000 TO 50,000.
*** WORK STATUS
*** A PROPOSAL HAS BEEN RECEIVED AND IS PRESENTLY BEING EVALUATED. THIS PROJECT IS BEHIND SCHEDULE DUE TO ADDITIONAL TIME FOR PROPOSAL SUBMISSION, THIS PROJECT SHOULD PROVIDE ECONOMICAL MID-VOLUME PRODUCTION OF CONTROL SYSTEM HOUSINGS.

ARMY CAD/CAM PROJECTS
08/31/79

***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	* 6 79 7807	PROGRAMMED OPTICAL SURFACING EQUIPMENT AND METHODOLOGY (CAM)	138	FABRICATION CAD/CAM
***	PROBLEM	SOLUTION		
***	* CURRENT TECHNIQUES FOR PITCH BUTTONING AND BLOCKING PRECISION LENSES USE OLDER CONVENTIONAL EQUIP. ACCURACY DEPENDS ON THE SKILL AND EXPERIENCE OF WELL TRAINED MASTER OPTICIANS WHO ARE BECOMING SCARCE.	ADOPT COMPUTER TECHNIQUES AND INSTRUMENTATION WITH CONTROLS TO PITCH BUTTONING AND BLOCKING OPERATIONS. THE END PRODUCT WILL BE AN INTEGRATED SURFACING SYSTEM IMPLEMENTED IN THE FIRE CONTROL FABRICATION FACILITY AT ARRADCOM.		
***	WORK STATUS			
***	* PROCUREMENT PACKAGE FOR A PROGRAMMABLE CURVE GENERATING/RADIUS TRUING MACHINE HAS BEEN COMPLETED. A SPECIFICATION DELINEATING THE CHAR AND PERFORMANCE REQ FOR A COMPUTER CONTROLLED GRINDING/POLISHING MACHINE HAS BEEN INITIATED.			

***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	* F 79 9938	THREE COLOR LIGHT EMITTING DIODE DISPLAY UNIT	510	FABRICATION CAD/CAM
***	PROBLEM	SOLUTION		
***	* PRESENT MANUFACTURING METHODS ARE TOO COSTLY AND COMPLICATED SINCE MANY COMPONENTS HAVE TO BE INTERCONNECTED AND MOUNTED BY HAND.	ESTABLISH NEW FABRICATION AND HANDLING TECHNIQUES TO REDUCE COSTS AND STILL PROVIDE A RELIABLE MODULE.		
***	WORK STATUS			
***	* A PROCUREMENT PACKAGE HAS BEEN PREPARED. THE PACING R+D FOR THIS PROJECT UNDERWENT CHANGES AND THE DESIGN OF THE MODULE WAS NOT FINALIZED UNTIL 1 MAR 79. THIS PROJECT IS CURRENTLY 9 MONTHS BEHIND SCHEDULE.			

***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	* R 79 3268	AUTOMATIC CONTROL OF PLATING (CAM)	450	FABRICATION CAD/CAM
***	PROBLEM	SOLUTION		
***	* THE BATHS USED FOR PLATING PRINTED WIRING BOARDS HAVE AN EXTREMELY LARGE NUMBER OF VARIABLES WHICH INFLUENCE PCB QUALITY. IF ANY VARIABLE DRIFTS OUT OF RELATIVELY NARROW BOUNDS, IMPAIRED QUALITY RESULTS.	DEVELOP CENTRALIZED CONTROLLER SYSTEM WHICH WILL SENSE MULTIPLE INPUTS, KEEPING PROCESS PARAMETERS IN BALANCE.		
***	WORK STATUS			
***	* PRESENT EFFORT IS BEING CARRIED OUT UNDER PROJECT R783268.			

ARMY CAD/CAM PROJECTS
08/31/79

*** PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
*** * R 79 3441	APPLICATION OF HIGH ENERGY LASER MANUFACTURING PROCESSES	400	FABRICATION CAD/CAM
PROBLEM	SOLUTION		
*** * COST IS A CRITICAL FACTOR IN CONVENTIONAL WELDING ASSOCIATED WITH THE MANUFACTURE OF HIGH VOLUME MISSILE SYSTEMS SUCH AS CONTAINERS, LAUNCHERS, ETC. THE IMPLEMENTATION OF LASER PROCESSES HAS THE POTENTIAL FOR ENORMOUS COST SAVINGS.	INTEGRATE HIGH ENERGY LASER TECHNOLOGY AND COMPUTER AIDED MANUFACTURING CONTROLS INTO SYSTEMS CAPABLE OF HIGH PRODUCTION RATES AND MINIMAL COSTS.		
WORK STATUS			
*** * EXCELLENT WELDS WERE MADE FOR ONE AND ONE QUARTER INCH THICK JOINTS.			
*** *****			
PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
*** * T 79 5082	FLEXIBLE MACHINING SYSTEMS PILOT LINE FOR TCV COMPONENTS	440	FABRICATION CAD/CAM
PROBLEM	SOLUTION		
*** * PARTS FOR TRACKED COMBAT VEHICLES ARE TYPICALLY NOT MANUFACTURED IN LARGE QUANTITIES, BECAUSE OF THIS, MASS PRODUCTION TECHNOLOGIES THAT RESULT IN LOWER PRODUCTION COSTS ARE NOT USED.	THE ADVANTAGES OF MASS PRODUCTION CAN BE REALIZED IN PRODUCTION USING MEDIUM QUANTITY SIZE LOTS BY A CONCEPT KNOWN AS, FLEXIBLE MACHINING SYSTEMS. THIS PROJECT WILL ADVANCE THE FMS TECHNOLOGY MAKING IT FEASIBLE TO UTILIZE FMS FOR THE MFG OF ARMY MATERIAL.		
WORK STATUS			
*** * WORK IS IN PLANNING STAGES. CURRENT EFFORTS ARE DIRECTED TOWARD ESTABLISHING A STEERING GROUP MADE UP OF USERS AND SUPPLIERS OF FMS TECHNOLOGY.			
*** *****			
PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
*** * 6 79 7802	ESTABLISH MACHINE TOOL PERFORMANCE SPECIFICATIONS	282	DATA BASE/DATA AUTOMATION
PROBLEM	SOLUTION		
*** * PROCUREMENT, ACQUISITION, AND APPLICATION OF NEW AND USED MACHINE TOOLS ARE BOTH PHYSICALLY AND ECONOMICALLY INEFFICIENT.	TESTS WILL BE DESIGNED AND PROCEDURES ESTABLISHED FOR TESTING MACHINE TOOLS AND DETERMINING OVERALL PERFORMANCE EFFICIENCY. GUIDELINES WILL BE WRITTEN FOR PROCUREMENT OF MACHINE TOOLS ACCORDING TO SPECIFIC PERFORMANCE REQUIREMENTS AND EFFICIENCIES.		
WORK STATUS			
*** * IN-HOUSE, PRIVATE INDUSTRY, AND MACHINE TOOL BUILDER PRACTICES FOR JUSTIFICATION, SELECTION, SPECIFICATION, AND TESTING WERE REVIEWED. THE CONTRACT SCOPE OF WORK TO ESTABLISH SYSTEMS PROCUREMENT METHODOLOGY WAS PREPARED AND CONTRACTUAL SERVICES WERE INITIATED.			

ARMY CAD/CAM PROJECTS
08/31/79

PROJ NUMBER TITLE
*** H 79 9963 LOW COST E-BEAM EQUIPMENT
PROBLEM

ELECTRON BEAM PHOTOLITHOGRAPHY IS NEEDED FOR DEFINING ARTWORK, PHOTO-MASKS, OR DIRECT EXPOSURE ON A WAFER WHERE CLOSE DEFINITION IS ESSENTIAL. IT IS COSTLY BECAUSE PRESENT EQUIPMENT IS DESIGNED FOR LARGE AREA EXPOSURE AND HIGH THROUGHPUT.
SOLUTION
DEVELOP A LOWER COST E-BEAM EXPOSURE MACHINE SUITED TO LOW VOLUME MILITARY APPLICATIONS. RETAIN THE 1/4 MICROMETER RESOLUTION AND HIGH REGISTRATION CAPABILITY.
TECHNOLOGY AREA
CAD/CAM INTERACTION

WORK STATUS

***** DELINQUENT STATUS REPORT *****

PROJ NUMBER TITLE
*** T 79 5024 GEAR DESIGN MFG UTILIZING COMPUTER TECHNOLOGY, CAM-PM2
PROBLEM

THE CONTROL OF DIMENSIONAL TOLERANCES OF FORGED RIVEL GEARS PRESENTS A UNIQUE PROBLEM SINCE THESE GEARS ARE NOT MFG. TO THEORETICAL EQUATIONS. THE BEVEL GEAR IS NOT DEFINED DIMENSIONALLY BUT IS PRESENTED AS REQUIREMENTS FOR TOOTH BEARING PATTERN
SOLUTION
THIS PROGRAM WILL ELIMINATE THE CURRENT TRIAL AND ERROR METHODS BY UTILIZING CAD/CAM METHODS AND INTERACTIVE GRAPHICS TECHNIQUES. EXCESSIVE SCRAP, UNEXPECTED DIE WEAR AND BREAKAGE, AND THE HIGH COST OF FORGING DIES WILL BE ADDRESSED.
TECHNOLOGY AREA
CAD/CAM INTERACTION

WORK STATUS

PHASE 1 OF A 3 PHASE CONTRACT WAS AWARDED DURING JUNE 1979.

PROJ NUMBER TITLE
*** 6 79 7724 GROUP TECHNOLOGY OF WEAPON SYSTEMS
PROBLEM

THERE IS A NEED TO REDUCE AND CONTROL THE PROLIFERATION OF PARTS AND DESIGNS FOR ITEMS MANUFACTURED AT WATERVLIET ARSENAL.
SOLUTION
THE ARMY HAS PURCHASED A GROUP CLASSIFICATION AND CODING SOFTWARE PACKAGE. ONCE THIS SYSTEM IS IMPLEMENTED, IT SHOULD BE POSSIBLE TO REDUCE THE NUMBER OF DIFFERENT PARTS THRU STANDARDIZATION.
TECHNOLOGY AREA
PLANNING/GROUP TECH

WORK STATUS

DRAWINGS HAVE BEEN CODED, ROUTINGS ASSEMBLED, AND ANALYZE THIS DATA IS IN THE FINAL PURCHASING CYCLE. A CONTRACT TO AN

ARMY CAD/CAM PROJECTS
08/31/79

***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	6 79 7949	APPLICATION OF GROUP TECHNOLOGY TO RIA MFR (CAM)	127	PLANNING/GROUP TECH
***	PROBLEM	SOLUTION		
***	<p>PRESENT PLANNING, SCHEDULING, AND MANUFACTURE OF WEAPON ASSEMBLIES AND COMPONENTS ARE BY SEPARATE LOTS AND PARTS WHICH REQUIRE MULTIPLE, MACHINING OPERATIONS, SET-UPS AND CHANGES OF TOOLING, AND CAUSE LOSS OF TIME AND MONEY.</p> <p>APPLY GROUP TECHNOLOGY TO CLASSIFY, CODE AND MANUFACTURE WEAPON ASSEMBLIES AND COMPONENTS AS FAMILIES OF PARTS, MATCH PARTS BY CONTOUR AND SIZE FOR SIMULTANEOUS MACHINING- AND, SUB-GROUP FOR MORE EFFICIENT MACHINING AND ASSEMBLY.</p>			
***	WORK STATUS			
***	<p>A CONTRACT TO PROVIDE TRAINING IN CLASSIFICATION AND CODING USING THE MICLASS SYSTEM IS IN THE FINAL STAGES. TWO CRT WERE APPROVED FOR PURCHASE.</p>			
***	-----			
***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	6 79 7963	GROUP TECH CELLULAR MFG FOR FC COMPONENTS ASSEMBLIES	188	PLANNING/GROUP TECH
***	PROBLEM	SOLUTION		
***	<p>FIRE CONTROL MANUFACTURING HAS RESULTED IN THE PROLIFERATION OF MANUFACTURING INFORMATION, LONG SET-UP TIMES OR MULTIPLE RESETTING OF MACHINES, UNDER-UTILIZATION OF MACHINES, LONG AND UNCERTAIN THROUGHPUT TIMES, AND HIGH WORK-IN PROGRESS.</p> <p>THROUGH GROUP TECHNOLOGY PART FAMILIES, MACHINE GROUPS, TOOL GROUPS AND WORK GROUPS WILL BE ESTABLISHED TO REALIZE THE FOLLOWING - REDUCED PLANNING EFFORT, SET-UP TIME, WORK-IN PROGRESS, LEVEL OF SCRAP AND MORE EFFECTIVE MACHINE OPERATIONS.</p>			
***	WORK STATUS			
***	<p>INITIAL PLANNING HAS BEEN COMPLETED, A CONTRACTOR HAS BEEN SELECTED.</p>			
***	-----			
***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	5 79 4322	MMT DESIGN/CHAR OF ELEC CONT SYST FOR PROD FAC	610	MANUFACTURING CONTROL
***	PROBLEM	SOLUTION		
***	<p>UNCERTAINTY OF THE EFFECT OF LONG TERM STORAGE DURING PLANT LAYAWAY ON ELECTRONIC CONTROL SYSTEMS AND THE ASSOCIATED IMPACT ON PRODUCTION BASE LEAD TIME.</p> <p>ANALYZE DATA CONCERNING DEGRADATION OF ELECTRONIC SYSTEMS DURING PERIODS OF DORMANCY AND DEVELOP CRITERIA FOR LAYAWAY PLANNING AND FUTURE SYSTEM DESIGN.</p>			
***	WORK STATUS			
***	<p>WORK PLANS HAVE BEEN PREPARED TO IDENTIFY POTENTIAL PROBLEM AREAS AND LAYAWAY PROCEDURES FOR SEVERAL AMMO PRODUCTION FACILITIES. PLANS TO IMPLEMENT A CYCLE PROCEDURE HAVE BEEN DEVELOPED. DATA CAPTURE FORMS WERE DEVELOPED FOR FAILURE REPORTS + ANALYSES</p>			

ARMY CAD/CAM PROJECTS
08/31/79

*** PROJ NUMBER TITLE PROJ COST

* R 79 3445 PRECISION MACHINING OF OPTICAL COMPONENT 300
PROBLEM SOLUTION

* EXISTING PRECISION MACHINING FACILITIES CANNOT MEET THE DEMAND, MEET OPTICAL DESIGN REQUIREMENTS, MEET PRODUCTION SCHEDULES, AND STAY WITHIN REASONABLE COST BOUNDARIES.
TECHNOLOGY AREA
MANUFACTURING CONTROL
INTEGRATE BOTH THE WELL PROVEN ERDA DEVELOPED SINGLE POINT DIAMOND MACHINING CAPABILITIES AND THE DEVELOPING INTERFEROMETRIC AIDED AND COMPUTER CONTROLLED TECHNOLOGY INTO A MANUFACTURING METHOD.
WORK STATUS

* A PROCUREMENT PACKAGE WAS COMPLETED, PROPOSALS WERE RECEIVED AND EVALUATED, CONTRACT AWARD IS EXPECTED IN JULY.

*** PROJ NUMBER TITLE PROJ COST

* S 79 6682 SIMULATION OF AMMUNITION PRODUCTION LINES 170
PROBLEM SOLUTION

* METHODS ARE NEEDED FOR DESIGNING PRODUCTION LINES OPERATING IN A REAL ENVIRONMENT AND SUBJECT TO THE UNCERTAINTIES ASSOCIATED WITH MACHINE BREAKDOWNS AND SCHEDULED MAINTENANCE.
TECHNOLOGY AREA
SIM, MODEL, OP RESCH
USE COMPUTER PROGRAM TO DEVELOP SIMULATIONS OF THE OPERATION OF MODEL LINE MODULES FOR PRODUCTION RATES SE MODERNIZATION + EXPANSION.

WORK STATUS

* MISSISSIPPI ARMY AMMO PLANT WAS SELECTED LINE FOR SIMULATION, FACTORS INCLUDE MACHINE RATES, DEFECT RATES, MAINTENANCE SCHEDULED AND UNSCHEDULED, BUFFER SIZES, OPERATION EXPERIENCE, MACHINE AVAILABILITY, STATISTICAL DISTRIBUTION OF MACHINE FAILURES.

*** PROJ NUMBER TITLE PROJ COST

* S 79 6716 MATH MODEL OF FORMING OPERATIONS FOR ARTILLERY DESIGN 306
PROBLEM SOLUTION

* TRIAL AND ERROR METHODS AND THE ABSENCE OF PROVEN AUTOMATED DESIGN TECHNIQUES FOR TOOLING CAUSE UNEXPECTED FAILURES IN FORMING OPERATIONS AND DELAYS IN STARTUP OF AMMUNITION PRODUCTION LINES.
TECHNOLOGY AREA
SIM, MODEL, OP RESCH
DEVELOP ANALYTICAL MODELS AND AUTOMATED TOOL DESIGN METHODS OF CRITICAL METAL FORMING OPERATIONS. TO OL DESIGNS THUS GENERATED WILL BE TESTED IN A PRODUCTION SETTING TO VERIFY THE COMPUTER MODELS. PROVEN MODELS ARE APPLICABLE TO CURRENT AND FUTURE ITEMS

WORK STATUS

* A CONTRACT WAS AWARD TO BATTELLE ON 16 MAY 79.

ARMY CAD/CAM PROJECTS
09/04/79

PROJ NUMBER TITLE PROJ COST

* 1 79 7292 IMPROVED PROD PROC TO REDUCE COST OF TESTING MICROPROCESSOR 53
PROBLEM SOLUTION

* TESTING OF CPU CARDS INTERMITTENT MICROPROCESSOR DEVELOP METHODS OF ISOLATING LARGE NUMBER OF LEADS
* PART FAILURES ARE MOST DIFFICULT PROBLEMS TO SOLV ON SAME BUSS FOR TEST PURPOSES, USE PLUGGABLE CPU
* E, STD AUTOMATIC TEST EQPT BECOMES INEFFICIENT, OR (REPLACING IT WITH A SIMULATOR WHENEVER THE PCB FA
* UNPREGNABLE, WHEN CMPLX INTEGRATED CKTS ARE PORTI ILS), AND DEVELOP PROGRAMMING TECHNIQUES.
* ONS OF THE PRINTED CKT CARD TESTED.

TECHNOLOGY AREA
TEST, INSP, EVAL

WORK STATUS

* ***** DELINQUENT STATUS REPORT *****

PROJ NUMBER TITLE PROJ COST

* 5 79 3961 IMPROVED 3-D VIBRATION ACCEPTANCE TEST FOR ART FUZES 282

SOLUTION

* CURRENT METHODS ARE COSTLY AND TIME CONSUMING, RA USE OF COMPUTERIZED 3-D VIBRATION / SHOCK TESTING
* RELY EXPOSE THE TEST ITEM TO TRUE SERVICE ENVIRON AS AN ACCEPTANCE TOOL SOLVES TECHNICAL + ECONOMIC
* MENTS, AND REQUIRE THREE TESTS TO ACCOUNT FOR ALL TEST DEFICIENCIES, TEST TIME IS REDUCED
* TEST AXES.

TECHNOLOGY AREA
TEST, INSP, EVAL

WORK STATUS

* 10-VTS ENGINEERING DESIGN HAS BEEN COMPLETED. THE PROCUREMENT PROCESS COMMENCED IN MID MAY 1979. THE
* PLANNED FUND OBLIGATION DATE FOR NAIF DOLLARS IS THE MONTH OF SEPTEMBER 1979.

PROJ NUMBER TITLE PROJ COST

* 6 79 8025 ELECTRONIC PROFILE READOUT GAGE FOR POWDER CHAMBER CONTROLS 106

SOLUTION

* POWDER CHAMBER SIZE IS CHECKED BY 4-6 FLUSH PIN G USING NEW PROXIMITY SENSING DEVICES 1 LT WEIGHT GA
* AGES EACH WEIGHING ABOUT 35 LBS. FROM EACH CHECK, GE WOULD REPLACE THE 4-6 PRESENT GAGES. IT WOULD P
* MACHINE ADJUSTMENTS MUST BE MADE TO MACHINE CHAM PROVIDE A SIGNAL FOR DIGITAL READOUT AND FOR TOOL C
* RER TO REQUIRED SPEC. ONTROL IN LATTER PHASE OF PROJECT.

TECHNOLOGY AREA
TEST, INSP, EVAL

WORK STATUS

* A REVIEW OF TECHNICAL DATA WAS CONDUCTED INCLUDING AN ON SITE INSPECTION OF THE PRESENT GAGING SYSTE
* M. THIS PROJECT IS FALLING BEHIND THE ORIGINAL -P16- SCHEDULE. 1-1/2 MONTH IN-HOUSE DELAY OF FUNDS I
* S PART OF THE PROBLEM.

ARMY CAD/CAM PROJECTS
08/31/79

PROJ NUMBER TITLE PROJ COST

* H 79 9844 CMOS CIRCUITS USING SILICON ON SAPPHIRE -SOS-TECHNOLOGY 700
PROBLEM SOLUTION

* SAPPHIRE WAFERS ARE PRODUCED BY THE CONVENTIONAL
GROWN BOULE METHOD, THIS APPROACH IS TIME CONSUMING AND COSTLY.
THIS PROJECT WILL ESTABLISH THE PRODUCTION CAPABILITY FOR THE GROWING OF MULTIPLE RIBBON SAPPHIRE, A
NO FOR FABRICATING SILICON ON SAPPHIRE COMPLEMENTARY METAL OXIDE SEMICONDUCTOR MONOLITHIC CIRCUITS.

TECHNOLOGY AREA
TEST, INSP, EVAL

WORK STATUS

* A PROCUREMENT DATA PACKAGE WAS SENT TO THE PROCUREMENT OFFICE ON 17 MAY 79. A CONTRACT SHOULD BE LET
BY NOV 79. CONTRACTOR WILL PULL MULTIPLE SAPPHIRE RIBBONS THRU EDGE DEFINING DIES. A SILICON FILM
WILL BE EPITAXIALLY GROWN ON THE SAPPHIRE RIBBONS.

*

PROJ NUMBER TITLE PROJ COST

* R 79 3242 DIGITAL FAULT ISOLATION OF PRINTED CIRCUIT BOARD 425

SOLUTION

* LOGICAL CIRCUIT BOARDS EMPLOYED IN MISSILES CAN FAIL IN A NUMBER OF DIFFERENT PLACES. IT IS A SLOW PROCESS TO ISOLATE THE FAULT TO THE DEFECTIVE ELEMENT.
THIS PROJECT WILL DEVELOP FAULT ISOLATION PROCEDURES APPLICABLE DURING CIRCUIT BOARD TEST TO ISOLATE FAULTS DOWN TO THE SMALLEST CIRCUIT PACKAGE ON THE BOARD. THE PROBE TRACE METHOD FOR FAULT ISOLATION WILL BE UTILIZED.

TECHNOLOGY AREA
TEST, INSP, EVAL

WORK STATUS

* NO WORK HAS YET BEEN DONE ON THIS FY79 PORTION. MICOM CAN EXERCISE AN OPTION ON ITS FY78 CONTRACT WITH HUGHES AIRCRAFT CO. TO COMPLETE ITS SAMPLING OF CIRCUIT BOARD TEST REQUIREMENTS AND ITS SURVEY OF AUTOMATIC TESTERS.

*

PROJ NUMBER TITLE PROJ COST

* S 79 6693 BALL PROPELLANT DETERGENT COATING-CAM RELATED 171

SOLUTION

* THE PRODUCT OF THE DETERGENT COATING STEP IN BALL PROPELLANT MANUFACTURING DEMONSTRATES SIGNIFICANT VARIABILITY IN CHARGE WEIGHT FROM BATCH TO BATCH.
BUILD A MATHEMATICAL MODEL OF THE DETERGENT PROCESS AND VALIDATE IT IN PILOT PLANT TESTS USING A PROGRAMMABLE PROCESS CONTROLLER.

TECHNOLOGY AREA
CONTINUOUS FLOW PROCESS

WORK STATUS

* PARTIAL MODEL OF DETERGENT COATING PROCESS CHECKED AGAINST BADGER AAP PRODUCTION DATA. GOOD FIT FOR 5 OF 6 TRANSPORT CONSTANTS. DIFFUSION COEFFICIENT, THE REMAINING CONSTANT, IS OFF BY A POWER OF 10.

FISCAL YEAR
80
CAM RELATED
MM & T
PROJECTS

ARMY CAD/CAM PROJECTS
08/31/79

*** PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
*** * 5 80 6736	TECH READINESS ACCEL THRU COMPUTER INTEGRATED MFG (CAM)	290	ARCHITECTURE
*** PROBLEM	SOLUTION		
*** * THE LEAD TIME REQUIRED TO BRING PRODUCTION LINES TO MOBILIZATION MAXIMUM IS INTOLERABLY EXCESSIVE. A CRITICAL DETERENT IS THE EXTREME SHORTAGE OF TOOLMAKERS AND MACHINISTS.	THE DEVELOPMENT AND IMPLEMENTATION OF A COMPUTER INTEGRATED MANUFACTURING SYSTEM WILL SIGNIFICANTLY REDUCE THE REQUIREMENT FOR HIGHLY SKILLED CRAFTSMEN.		
*** * 1 80 7183	SEMI-AUTO COMPOSITE MANUFAC SYSTEM HELICOPTER SECONDARY STRU	155	FABRICATION CAD/CAM
*** PROBLEM	SOLUTION		
*** * HELICOPTER FUSELAGE STRUCTURES HAVE HIGH MANUFACTURING COST DUE TO HIGH PART COUNT AND HIGH ASSEMBLY COSTS. METHODS OF COMPOSITE FABRICATION HAVE BEEN INVESTIGATED BUT HAND OPERATIONS RESULT IN HIGH LABOR COSTS.	FABRICATE AND DEMONSTRATE A SEMI-AUTOMATED COMPOSITE MANUFACTURING SYSTEM FOR THE PRODUCTION OF COMPOSITE HELICOPTER FUSELAGE STRUCTURAL PARTS.		
*** * R 80 101A	IMPROVED MFG. PROCESSES FOR DRY TUNED ACCELEROMETERS (CAM)	380	FABRICATION CAD/CAM
*** PROBLEM	SOLUTION		
*** * THERE IS A NEED TO ESTABLISH MANUFACTURING METHODS NECESSARY TO INCREASE YIELD AND REDUCE COST OF DRY TUNED ACCELEROMETERS. THE PRESENT METHOD IS LABOR INTENSIVE AND PRONE TO ERROR.	ELECTRO-DISCHARGE MACHINING CAN BE ADAPTED TO AUTOMATED MACHINING OF THE COMPLEX DRY FLEXURE SUPPORTS. THIS APPROACH WILL PROVIDE THE FLEXIBILITY TO EXPERIMENT TO OPTIMIZE THE SUPPORT DESIGN FOR QUANTITY PRODUCTION.		

ARMY CAD/CAM PROJECTS
08/31/79

***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	* T 80 5082	FLEXIBLE MACHINING SYSTEM, PILOT LINE FOR TCV COMPONENTS	880	FABRICATION CAD/CAM
***	PROBLEM	SOLUTION		
***	* PARTS FOR TRACKED COMBAT VEHICLES ARE TYPICALLY NOT MANUFACTURED IN LARGE QUANTITIES. BECAUSE OF THIS, MASS PROD TECHNOLOGIES THAT RESULT IN LOWER PRODUCTION COSTS ARE NOT USED.	THE ADVANTAGES OF MASS PROD CAN BE REALIZED IN PRODUCING MEDIUM QUANTITY SIZE LOTS BY A CONCEPT KNOWN AS, FLEXIBLE MACHINING SYSTEMS. THIS PROJECT WILL ADVANCE THE FMS TECHNOLOGY MAKING IT FEASIBLE TO UTILIZE FMS FOR THE MFG OF ARMY MATERIEL.		
***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	* F 80 3036	CAD/CAM OF SPECIAL ELECTRONIC CIRCUITS	140	CAD/CAM INTERACTION
***	PROBLEM	SOLUTION		
***	* SEMICONDUCTOR INTEGRATED CIRCUITS NEEDED FOR SPECIAL COMMUNICATIONS EQUIP. MUST BE CUSTOM DESIGNED FOR EACH NEW APPLICATION. EACH IC REQUIRES SEVERAL MASK SETS AND A NUMBER OF IC ARE REQUIRED FOR EACH DEVICE. CONSIDERABLE ARTWORK IS REQUIRED.	DEVELOP COMPUTER AIDED MANUFACTURING TECHNIQUES THAT WILL REDUCE THE COST OF AND IMPROVE THE RELIABILITY OF SEMICONDUCTOR INTEGRATED CIRCUITS.		
***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	* 6 80 7949	APPLICATION OF GROUP TECHNOLOGY TO RIA MFG (CAM)	155	PLANNING/GROUP TECH
***	PROBLEM	SOLUTION		
***	* PRESENT PLANNING, SCHEDULING, AND MANUFACTURE OF WEAPON ASSEMBLIES AND COMPONENTS ARE BY SEPARATE LOTS AND PARTS WHICH REQUIRE MULTIPLE, MACHINING OPERATIONS, SET-UPS AND CHANGES OF TOOLING, AND CAUSE LOSS OF TIME AND MONEY.	APPLY GROUP TECHNOLOGY TO CLASSIFY, CODE AND MANUFACTURE WEAPON ASSEMBLIES AND COMPONENTS AS FAMILIES OF PARTS. MATCH PARTS BY CONTOUR AND SIZE FOR SIMULTANEOUS MACHINING- AND, SUB-GROUP FOR MORE EFFICIENT MACHINING AND ASSEMBLY.		

ARMY CAD/CAM PROJECTS
08/31/79

***	PROJ NUMBER	TITLE	PROJ COST	
***	* 6 80 7963	GROUP TECHNOLOGY FOR FIRE CONTROL PARTS AND ASSEMBLIES	303	
	PROBLEM	SOLUTION		TECHNOLOGY AREA
***	* FIRE CONTROL MANUFACTURING HAS RESULTED IN THE PRODUCTION OF MANUFACTURING INFORMATION, LONG SET-UP TIMES OR MULTIPLE RESETS OF MACHINES, UNDER-UTILIZATION OF MACHINES, LONG AND UNCERTAIN THROUGHPUT TIMES, AND HIGH WORK-IN-PROGRESS.	THROUGH GROUP TECHNOLOGY PART FAMILIES, MACHINE GROUPS, TOOL GROUPS AND WORK GROUPS WILL BE ESTABLISHED TO REALIZE THE FOLLOWING - REDUCED PLANNING EFFORT, SET-UP TIME, WORK-IN-PROGRESS, LEVEL OF SCRAP AND MORE EFFECTIVE MACHINE OPERATIONS.		PLANNING/GROUP TECH
***	-----			
***	PROJ NUMBER	TITLE	PROJ COST	
***	* 5 80 4322	CHARACTERIZE DORMANCY EFFECT ON ELECTRONIC EQUIPMENT	515	
	PROBLEM	SOLUTION		TECHNOLOGY AREA
***	* UNCERTAINTY OF THE EFFECT OF LONG TERM STORAGE DURING PLANT LAYAWAY ON ELECTRONIC CONTROL SYSTEMS AND THE ASSOCIATED IMPACT ON PRODUCTION BASE LEAD TIME.	ANALYZE DATA CONCERNING DEGRADATION OF ELECTRONIC SYSTEMS DURING PERIODS OF DORMANCY AND DEVELOP CRITERIA FOR LAYAWAY PLANNING AND FUTURE SYSTEM DESIGN.		MANUFACTURING CONTROL
***	-----			
***	PROJ NUMBER	TITLE	PROJ COST	
***	* 6 80 8034	MANUFACTURING SHOP FLOOR FEEDBACK SYSTEM (CAM)	84	
	PROBLEM	SOLUTION		TECHNOLOGY AREA
***	* ROCK ISLAND ARSENAL'S CURRENT METHOD OF COLLECTING SHOP FLOOR DATA IS COSTLY, UNRELIABLE AND DOES NOT PROVIDE ENOUGH DATA FOR PROPER CONTROL OF PRODUCTION.	DESIGN AND INSTALL A MANUFACTURING SHOP FLOOR FEEDBACK SYSTEM UTILIZING THE LATEST ADVANCEMENTS IN COMPUTER HARDWARE AND PRODUCTION MANAGEMENT CONCEPTS.		MANUFACTURING CONTROL
***	-----			

ARMY CAD/CAM PROJECTS
08/31/79

***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA

***	* H 80 3010	MILLIMETER-WAVE SOURCES FOR 60, 94, AND 140 GHZ	900	MANUFACTURING CONTROL
***	PROBLEM	SOLUTION		
***	* TO ESTABLISH A MANUFACTURING CAPABILITY FOR PRODUCTION OF IMPATT DIODES WHICH ARE UNIFORM ENOUGH TO BE FIELD REPLACEABLE IN ARMY SYSTEMS.	ESTABLISH TECHNIQUES AND PROCESSES CAPABLE OF PRODUCING SILICON DOUBLE DRIFT IMPATT SOURCES. PRECISION AND RIGOROUS COMPUTER CONTROL OF ALL MATERIAL IS REQUIRED.		

***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA

***	* R 80 3281	MANUF TECH PROJ F/SILVER-ZINC GUIDANCE BATTERIES (CAM)	250	MANUFACTURING CONTROL
***	PROBLEM	SOLUTION		
***	* ANODE AND CATHODE MANUFACTURING FOR SILVER ZINC BATTERIES IS BASED ON TWENTY YEAR OLD TECHNIQUES. REQUIREMENTS CALL FOR IN LINE PRODUCTION AND ACCEPTANCE TESTS.	DEVELOP A COMPUTER AIDED MANUFACTURING PROCESS FOR SILVER-ZINC BATTERIES WITH CONTROLLING SENSORS FOR ACCURATELY MEASURING MATERIALS AND ELECTROCHEMICAL COMBINATION.		

***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA

***	* R 80 3445	PRECISION MACHINING OF OPTICAL COMPONENTS	400	MANUFACTURING CONTROL
***	PROBLEM	SOLUTION		
***	* EXISTING PRECISION MACHINING FACILITIES CANNOT KEEP UP WITH THE DEMAND, MEET OPTICAL DESIGN REQUIREMENTS, MEET PRODUCTION SCHEDULES, AND STAY WITHIN REASONABLE COST BOUNDARIES.	INTEGRATE BOTH THE WELL PROVEN ERDA DEVELOPED SINGLE POINT DIAMOND MACHINING CAPABILITIES AND THE DEVELOPING INTERFEROMETRIC AIDED AND COMPUTER CONTROLLED TECHNOLOGY INTO A MANUFACTURING METHOD.		

ARMY CAD/CAM PROJECTS
09/04/79

***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	* 6 80 7928	ROBOTIZED BENCHING OPERATIONS	113	
***	PROBLEM	SOLUTION		
***	* BENCHING OPERATIONS ON BREECHBLOCKS AND RINGS ARE UNSAFE AND TIME CONSUMING.	DEVELOP INDUSTRIAL ROBOT TO PERFORM THESE OPERATIONS.		MAT HANDLING/STORAGE
***	-----			
***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	* 1 80 7292	MICROPROCESSOR AND LSI FAULT ISOLATION AND TESTING	150	
***	PROBLEM	SOLUTION		
***	* TESTING OF CPU CARDS INTERMITTENT MICROPROCESSOR PART FAILURES ARE MOST DIFFICULT PROBLEMS TO SOLVE. STD AUTOMATIC TEST EQPT BECOMES INEFFICIENT, OR UNPREGNABLE, WHEN CMPLY INTEGRATED CKTS ARE PORTY DNS OF THE PRINTED CKT CARD TESTED.	DEVELOP METHODS OF ISOLATING LARGE NUMBER OF LEADS ON SAME BUS FOR TEST PURPOSES, USE PLUGGABLE CPU (REPLACING IT WITH A SIMULATOR WHENEVER THE PCB FA ILS), AND DEVELOP PROGRAMMING TECHNIQUES.		TEST, INSP, EVAL
***	-----			
***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	* 5 80 3961	IMPR (3=0) VIB ACCEPT TSTNG F ART FUZES AND S/A MECHANISMS	605	
***	PROBLEM	SOLUTION		
***	* CURRENT METHODS ARE COSTLY AND TIME CONSUMING, RA RELY EXPOSE THE TEST ITEM TO TRUE SERVICE ENVIRONMENTS, AND REQUIRE THREE TESTS TO ACCOUNT FOR ALL TEST AXES.	USE OF COMPUTERIZED 3=0 VIBRATION / SHOCK TESTING AS AN ACCEPTANCE TOOL SOLVES TECHNICAL + ECONOMIC TEST DEFICIENCIES. TEST TIME IS REDUCED		TEST, INSP, EVAL
***	-----			

FISCAL YEAR
81
CAM RELATED
MM & T
PROJECTS

ARMY CAD/CAM PROJECTS
08/31/79

* PROJ NUMBER TITLE PROJ COST
* 1 81 7183 SEMI-AUTO COMP MANUF SYS F/HELI FUSELAGE SECONDARY STRUC 300
*
* PROBLEM SOLUTION TECHNOLOGY AREA
* ***
* HELICOPTER FUSELAGE STRUCTURES HAVE HIGH MANUFACTURING COST DUE TO HIGH PART COUNT AND HIGH ASSEMBLY COSTS. METHODS OF COMPOSITE FABRICATION HAVE BEEN INVESTIGATED BUT HAND OPERATIONS RESULT IN HIGH LABOR COSTS.
* FABRICATE AND DEMONSTRATE A SEMI-AUTOMATED COMPOSITE MANUFACTURING SYSTEM FOR THE PRODUCTION OF COMPOSITE HELICOPTER FUSELAGE STRUCTURAL PARTS.
* FABRICATION CAD/CAM

* PROJ NUMBER TITLE PROJ COST
* 6 81 7807 PROGRAMMED OPTICAL SURFACING EQUIPMENT/METHODOLOGY 126
*
* PROBLEM SOLUTION TECHNOLOGY AREA
* ***
* CURRENT TECHNIQUES FOR PITCH BUTTUNING AND BLOCKING PRECISION LENSES USE OLDER CONVENTIONAL EQUIPMENT. ACCURACY DEPENDS ON THE SKILL AND EXPERIENCE OF WELL TRAINED MASTER OPTICIANS WHO ARE BECOMING SCARCE.
* ADOPT COMPUTER TECHNIQUES AND INSTRUMENTATION WITH CONTROLS TO PITCH BUTTUNING AND BLOCKING OPERATIONS. THE END PRODUCT WILL BE AN INTEGRATED SURFACING SYSTEM IMPLEMENTED IN THE FIRE CONTROL FABRICATION FACILITY AT ARRADCOM.
* FABRICATION CAD/CAM

* PROJ NUMBER TITLE PROJ COST
* 4 81 9845 MMT COMPUTER-AIDED FLIR ASPHERIC LENS FABRICATION CAM 518
*
* PROBLEM SOLUTION TECHNOLOGY AREA
* ***
* ASPHERIC LENSES REQUIRED BY FLIR SENSORS HAVE SEVERE WEIGHT AND SIZE LIMITATIONS AND ARE DIFFICULT TO MFG. BECAUSE OF THE REPETITIVE PROCESS OF SURFACE SHAPING.
* PROVIDE MFG. METHODS FOR PRODUCING ASPHERICAL FLIR LENS USING A SINGLE POINT DIAMOND TURNING LATHE INTEGRATED WITH COMPUTER CONTROLS AND LASER INTERFEROMETRIC FEEDBACK OF CUTTING TOOL POSITIONS.
* FABRICATION CAD/CAM

ARMY CAD/CAM PROJECTS
08/31/79

* PROJ NUMBER TITLE PROJ COST
* T 81 5082 FLEXIBLE MACHINING SYS (FMS) PILOT LINE F/TCV COMPONENTS 880
* PROBLEM SOLUTION
* THE ADVANTAGES OF MASS PDN CAN BE REALIZED IN PROD
* OT MANUFACTURED IN LARGE QUANTITIES, BECAUSE OF T
* HIS, MASS PDN TECHNOLOGIES THAT RESULT IN LOWER P
* DN COSTS ARE NOT USED.
* FABRICATION CAD/CAM
* ADVANCE THE FMS TECHNOLOGY MAKING IT FEASIBLE TO
* UTILIZE FMS FOR THE MFG OF ARMY MATERIEL.

* PROJ NUMBER TITLE PROJ COST
* T 81 5086 LASER HARDENING OF TRANSMISSION COMPONENTS CAM (PHASE I) 255
* PROBLEM SOLUTION
* FLAME AND INDUCTION HARDENING IS EMPLOYED TO SURF
* ACE HARDEN VEHICLE TRANSMISSION PARTS. THESE PROC
* ESSES ARE INEFFICIENT.
* ESTABLISH PARAMETERS AND CONTROLS NEEDED FOR LASER
* SURFACE HARDENING
* FABRICATION CAD/CAM

* PROJ NUMBER TITLE PROJ COST
* T 81 5091 HEAVY ALUMINUM PLATE FABRICATION (PHASE I) 420
* PROBLEM SOLUTION
* MANY COMBAT AND TACTICAL VEHICLE HULLS AND THEIR
* COMPONENTS ARE FABRICATED FROM HEAVY ALUMINUM PLA
* TE. CUTTING THIS HEAVY ALUMINUM PLATE TO SPECIFIC
* D CONTOURS AND WELDING THE PIECES TOGETHER REQUIR
* ES A GREAT DEAL OF MANUAL LABOR.
* ESTABLISH THE CAPABILITY TO CUT HEAVY ALUMINUM PLA
* TE RAPIDLY USING PLASMA ARC WITH NUMERICAL CONTROL
* S. PROCESS PARAMETERS WILL BE ESTABLISHED FOR GAS
* METAL ARC, GAS TUNGSTEN ARC, AND ELECTRON BEAM WEL
* DING OF HEAVY ALUMINUM PLATE.
* FABRICATION CAD/CAM

ARMY CAD/CAM PROJECTS
08/31/79

*** PROJ NUMBER TITLE PROJ COST TECHNOLOGY AREA
*** T 81 6008 LASER MACHINING (PHASE I) 250 FABRICATION CAD/CAM
PROBLEM SOLUTION
*** CONVENTIONAL MACHINING OF DIFFICULT TO MACHINE MATERIALS IS VERY EXPENSIVE, RAPID TOOL WEAR AND LOCALIZED HEATING OF THE WORKPIECE IMPACT REMOVAL RATES AND METALLURGICAL CHARACTERISTICS.
THIS PROGRAM WILL DEVELOP TECHNIQUES FOR LASER MACHINING BY NUMERICAL CONTROL.

*** PROJ NUMBER TITLE PROJ COST TECHNOLOGY AREA
*** F 81 3005 GRAPHICAL PART PROGRAMMING EVALUATION (CAM) 115 CAD/CAM INTERACTION
PROBLEM SOLUTION
*** POTENTIAL EXISTS TO EXTEND THE EXISTING COMPUTER-AIDED INTERACTIVE DESIGN SYSTEMS FOR THE CREATION OF NUMERICAL CONTROL TAPES AND THREE-DIMENSIONAL PARTS GEOMETRIES TO A BROAD RANGE OF DOD EQUIPMENT REQUIREMENTS.
THIS PROJECT WILL EVALUATE THE CAPABILITY OF EXISTING COMPUTER-AIDED INTERACTIVE DESIGN SYSTEMS TO PRODUCE NUMERICAL CONTROL PART PROGRAMS AND PART GEOMETRIES FOR DOD PRODUCTION REQUIREMENTS.

*** PROJ NUMBER TITLE PROJ COST TECHNOLOGY AREA
*** F 81 3036 CAD/CAM OF SPECIAL ELECTRONIC CIRCUITS (CAM) 2000 CAD/CAM INTERACTION
PROBLEM SOLUTION
*** SEMICONDUCTOR INTEGRATED CIRCUITS NEEDED FOR SPECIAL COMMUNICATIONS EQUIP. MUST BE CUSTOM DESIGNED FOR EACH NEW APPLICATION, EACH IC REQUIRES SEVERAL MASK SETS AND A NUMBER OF IC ARE REQUIRED FOR EACH DEVICE, CONSIDERABLE ARTWORK IS REQUIRED.
DEVELOP COMPUTER-AIDED MANUFACTURING TECHNIQUES THAT WILL REDUCE THE COST OF AND IMPROVE THE RELIABILITY OF SEMICONDUCTOR INTEGRATED CIRCUITS.

ARMY CAD/CAM PROJECTS
08/31/79

***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	* T 81 5024	GEAR DIE DESIGN AND MFG UTILIZING COMPUTER TECHNOLOGY	350	CAD/CAM INTERACTION
***	PROBLEM	SOLUTION		
***	* THE CONTROL OF DIMENSIONAL TOLERANCES OF FORGED B LEVEL GEARS PRESENTS A UNIQUE PROBLEM SINCE THESE GEARS ARE NOT MFG. TO THEORETICAL EQUATIONS. THE BEVEL GEAR IS NOT DEFINED DIMENSIONALLY BUT IS PR ESSENT AS REQUIREMENTS FOR TOOTH BEARING PATTERN	THIS PROGRAM WILL ELIMINATE THE CURRENT TRIAL AND ERROR METHODS BY UTILIZING CAD/CAM METHODS AND INTE RACTIVE GRAPHICS TECHNIQUES. EXCESSIVE SCRAP, UNEX PECTED DIE WEAR AND BREAKAGE, AND THE HIGH COST OF FORGING DIES WILL BE ADDRESSED.		
***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	* 6 81 7724	GROUP TECHNOLOGY OF WEAPON SYSTEMS (CAM)	224	PLANNING/GROUP TECH
***	PROBLEM	SOLUTION		
***	* THERE IS A NEED TO REDUCE AND CONTROL THE PROLIFE RATION OF PARTS AND DESIGNS FOR ITEMS MANUFACTURED AT WATERVLIET ARSENAL.	THE ARMY HAS PURCHASED A GROUP CLASSIFICATION AND CODING SOFTWARE PACKAGE. ONCE THIS SYSTEM IS IMPL MENTED, IT SHOULD BE POSSIBLE TO REDUCE THE NUMBER OF DIFFERENT PARTS THRU STANDARDIZATION.		
***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	* 1 81 7248	CLOSED LOOP MACHINING T700 MID FRAME	540	MANUFACTURING CONTROL
***	PROBLEM	SOLUTION		
***	* THE ENGINE MID-FRAME HAS 22 DIAMETERS WITH TOLERA NCES RANGING FROM .001 IN. THESE TOLERANCES RESUL T IN HIGH MACHINING, REWORK AND INSPECTION COSTS.	DEVELOP CLOSED LOOP MACHINING THAT WILL AUTOMATICA LLY COMPENSATE FOR ANY DEVIATION IN NUMERICAL CONT ROLLED PROGRAMMED PLAN THEREBY REDUCING PRODUCTION COSTS.		

ARMY CAD/CAM PROJECTS
08/31/79

***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	* 6 81 8120	ADAPTIVE CONTROL TECHNOLOGY (CAM)	225	MANUFACTURING CONTROL
***	PROBLEM	SOLUTION		
***	* INEFFICIENT USE OF NC MACHINE TOOLS DUE TO CONSERVATION PROGRAMMING IS UNECONOMICAL. ALSO THE INABILITY TO MONITOR A MULTIPLICITY OF TOOL FORMS CHARACTERISTIC OF NC MACHINE CAPABILITY, E.G. MANY TOOL SIZES WITH DIFFERENT LOADING, IS A LIMITER.	EXTEND THE CURRENT ADAPTIVE CONTROL TECHNOLOGY TO CONTROL THE TOOL LOADS IN SMALL MILLS AND DRILLS SO THEY CAN BE PERFORMED IN THE SAME SETUPS. THIS WOULD MAXIMIZE THE USE OF BOTH NC EQUIPMENT AND TOOL SYSTEMS.		
***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	* 6 81 8135	IN-PROCESS CONTROL OF MACHINING	750	MANUFACTURING CONTROL
***	PROBLEM	SOLUTION		
***	* DURING MFG. OF RECOIL CONTROL ORIFICES, ERRORS ARE INTRODUCED WHICH REQUIRE REWORK. CORRECTIVE ACTIONS INVOLVE COSTLY DETAILED INSPECTION AND REANALYSIS WITH COMPUTERIZED DESIGN PROGRAMS TO DEFINE POSSIBLE REWORK ALTERNATIVES.	AN IMPROVED MANUFACTURING METHOD UTILIZING ADAPTIVE CONTROLS AND AUTOMATED INSPECTION EQUIPMENT WILL BE ESTABLISHED. MACHINE TOOLS WILL BE RETROFITTED.		
***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	* 6 81 8154	DISTRIBUTED DIRECT NUMERICAL CONTROL (CNC)	337	MANUFACTURING CONTROL
***	PROBLEM	SOLUTION		
***	* NUMERICAL CONTROL MACHINE TOOLS OFFER MANY ADVANTAGES OVER CONVENTIONAL MACHINE TOOLS BUT HAVE CERTAIN DISADVANTAGES. ONE PROBLEM AREA IS GETTING MACHINE INSTRUCTIONS TO THE MACHINE TOOL AND COLLECTING MANAGEMENT INFORMATION.	ELIMINATE PHYSICAL DEVICES THAT ARE MANUALLY LOADED ON CONTROL UNITS BY PROVIDING MACHINE INSTRUCTIONS DIRECTLY FROM A CENTRAL COMPUTER. DISADVANTAGES TO DIRECT NUMERICAL CONTROL WILL BE SOLVED BY INSTALLATION OF COMPUTER NUMERICAL CONTROLS (CNC).		

ARMY CAD/CAM PROJECTS
08/31/79

***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	6 81 8226	COMPUTER AIDED WORK MEASUREMENT SYSTEM (CAM RELATED)	187	MANUFACTURING CONTROL
***	PROBLEM	SOLUTION		
***	TIME STUDIES AND USE OF STANDARD DATA PRESENTLY REQUIRE TIME CONSUMING MANUAL CALCULATIONS TO DEVELOP PRODUCTION STANDARDS.			
***	DEVELOP A COMPUTERIZED WORK MEASUREMENT SYSTEM THAT WILL VIRTUALLY ELIMINATE MANUAL CALCULATIONS IN THE DEVELOPMENT OF PRODUCTION STANDARDS. ROUTINES WILL INCLUDE PROGRAMS TO DEVELOP FINISHED STANDARDS FROM RAW TIME STUDIES OR STANDARD DATA.			
***	-----			
***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	6 81 3281	SILVER-ZINC GUIDANCE BATTERIES (CAM)	250	MANUFACTURING CONTROL
***	PROBLEM	SOLUTION		
***	ANODE AND CATHODE MANUFACTURING FOR SILVER ZINC BATTERIES IS BASED ON TWENTY YEAR OLD TECHNIQUES. REQUIREMENTS CALL FOR IN LINE PRODUCTION AND ACCEPTANCE TESTS.			
***	DEVELOP A COMPUTER AIDED MANUFACTURING PROCESS FOR SILVER-ZINC BATTERIES WITH CONTROLLING SENSORS FOR ACCURATELY MEASURING MATERIALS AND ELECTROCHEMICAL COMBINATION.			
***	-----			
***	PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
***	6 81 6053	WELDING SYSTEMS INTEGRATION	350	MANUFACTURING CONTROL
***	PROBLEM	SOLUTION		
***	OF ALL METAL WORKING PROCESSES EMPLOYED IN TRACKED COMBAT VEHICLES MANUFACTURING, WELDING IS THE MOST LABOR INTENSIVE AND AFTER MACHINING, THE MOST COSTLY. AUTOMATION WHICH COULD REDUCE THESE COSTS IS AS YET AN UNACHIEVED GOAL.			
***	UNDERTAKE A COORDINATED PROGRAM TO INTEGRATE EXISTING EXPERTISE AND TECHNOLOGY TO ADDRESS ONE APPLICATION (XMI HULL). EXPERTISE WILL BE IN AREAS OF WELDING PROCESS CONTROL, SENSORY TECHNOLOGY, STRESS ANALYSIS, AND COMPUTER CONTROL.			
***	-----			

ARMY CAD/CAM PROJECTS
08/31/79

* PROJ NUMBER TITLE PROJ COST

* 5 81 6716 DEV COMP-AID MODEL OF FORMING OPERATIONS FOR ARTILLERY MPTS 150
*
* PROBLEM SOLUTION

* TRIAL AND ERROR METHODS AND THE ABSENCE OF PROVEN DEVELOP ANALYTICAL MODELS AND AUTOMATED TOOL DESIG
* AUTOMATED DESIGN TECHNIQUES FOR TOOLING CAUSE UN N METHODS OF CRITICAL METAL FORMING OPERATIONS. TO
* EXPECTED FAILURES IN FORMING OPERATIONS AND DELAY OL DESIGNS THUS GENERATED WILL BE TESTED IN A PROD
* S IN STARTUP OF AMMUNITION PRODUCTION LINES. UCTION SETTING TO VERIFY THE COMPUTER MODELS. PROV
* EN MODELS ARE APPLICABLE TO CURRENT AND FUTURE ITE
*
* TECHNOLOGY AREA
* SIM, MODEL, OP RESCH

* PROJ NUMBER TITLE PROJ COST

* 6 81 8136 IMPROVED IMPULSE PROGRAMMERS FOR HYDRAULIC SIMULATORS 80
*
* PROBLEM SOLUTION

* UNDESIRABLE SHOCK AND VIBRATION IN TESTS OF CERTA DESIGN AND MANUFACTURE IMPROVED IMPULSE PROGRAMMER
* IN RECOIL MECHANISMS LIMIT THE EXTENT OF TESTING S TO GET BETTER SIMULATED FIRING THAT WILL BE MORE
* THAT CAN BE ACCOMMODATED ON THE HYDRAULIC ARTILLER EFFECTIVE FOR A GREATER NUMBER OF WEAPONS.
* Y TEST SIMULATOR.

* PROJ NUMBER TITLE PROJ COST

* 6 81 7928 ROTORIZED BENCHING OPERATIONS (CAM) 287
*
* PROBLEM SOLUTION

* BENCHING OPERATIONS ON BREECHBLOCKS AND RINGS ARE DEVELOP INDUSTRIAL ROBOT TO PERFORM THESE OPERATIO
* UNSAFE AND TIME CONSUMING. NS.
*
* TECHNOLOGY AREA
* MAT HANDLING/STORAGE

ARMY CAD/CAM PROJECTS
08/31/79

PROJ NUMBER	TITLE	PROJ COST	TECHNOLOGY AREA
1 81 7175	AUTOMATED BLADE CONTOUR INSPECTION/COMPUTER AIDED INSPECTION	275	TEST, INSP, EVAL
<p>PROBLEM</p> <p>IT IS NECESSARY TO MEASURE THE CONTOUR OF CERTAIN HELICOPTER SURFACES WITH A HIGH DEGREE OF ACCURACY. HAND MEASUREMENTS ARE TIME CONSUMING AND SUSCEPTIBLE TO ERRORS. CONVENTIONAL MEASURING SYSTEMS USING CONTACT PROBES ARE NOT ADEQUATE.</p>			
<p>SOLUTION</p> <p>DESIGN AND DEVELOP A COMPUTER AIDED GAUGING SYSTEM TO AUTOMATICALLY INSPECT CONTOURS OF SPARS AND AIRFOILS OF HELICOPTER ROTOR BLADES.</p>			

APPENDIXES

APPENDIX A

CAM

TECHNOLOGY AREAS

TECHNOLOGY AREAS DESCRIPTIONS

To aid in analyzing individual MMT projects, each CAM related project is categorized into one of the following technology areas. These tech areas were originally identified in the Air Force's ICAM Program and were refined by the MTAG CAD/CAM Subcommittee.

Underlying the optimum benefits obtainable from utilizing CAM technology is the systems approach. Interrelationships between the various subsystems within an organization must be taken into consideration. These technology areas represent the "system" and direct thinking toward an integrated approach.

100 ARCHITECTURE

The purpose of the manufacturing architecture is to provide a clear understanding of the manufacturing environment and the interrelationships between subsystems that exist today. The manufacturing architecture, or framework provides a common baseline in building integrated manufacturing systems.

200 FABRICATION

The fabrication technology area serves as a focus for all other technology area activities. Projects categorized into this area are directed toward increasing the productivity of manufacturing by systematically applying computer technology to all functions which directly and indirectly participate in fabricating parts.

300 DATA BASE/DATA AUTOMATION

Data base and data automation technology required to support integration of the many stages and disciplines of manufacturing.

400 CAD/CAM INTERACTION

The purpose of this technology thrust area is to establish subsystems and procedures which will integrate the efforts of product design and manufacturing. The underlying concept is that of a common data base between engineering and manufacturing.

500 PLANNING AND GROUP TECHNOLOGY

Technology directed at optimizing process planning, production scheduling and control, factory layout and other tasks normally performed by indirect personnel that have a significant impact on manufacturing cost.

600 MANUFACTURING CONTROL

Generic technology for producing management oriented information tools for scheduling, monitoring and controlling operations within the manufacturing environment. Closely related to the fabrication and planning and group technology areas.

700 ASSEMBLY

The integration of computer aided technology into assembly operations.

800 SIMULATION, MODELING AND OPERATIONS RESEARCH

Soft technology for optimizing manufacturing systems through the application of operations research techniques.

900 MATERIALS HANDLING AND STORAGE

The integration of computer aided technology to aid in material handling. Objectives here include complying with OSHA and EPA standards and reducing costs and materials handling time through automated material storage, handling, and retrieval systems.

1000 TEST, INSPECTION AND EVALUATION

Develop and transition real time, computerized, nondestructive testing techniques for use in fabrication and assembly operations. Emphasis is put on automatic, in-process inspection and decision making without human intervention.

1100 CONTINUOUS FLOW PROCESSES

This technology area addresses the range of manufacturing processes that, for the most part, are continuous with minimum human interaction.

APPENDIX B

SUMMARY CHARTS

TECHNOLOGY AREAS
SUMMARY

PROJECT	THRUST AREA (\$000)										
	100	200	300	400	500	600	700	800	900	1000	1100
1 79 7183		100									
1 79 7292										53	
5 79 3961										282	
5 79 4124		930									
5 79 4322						610					
5 79 6682								170			
5 79 6693											171
5 79 6716								306			
5 79 6736	256										
6 79 7724					83						
6 79 7802			282								
6 79 7807		138									
6 79 7949					127						
6 79 7963					188						
6 79 8025										106	
F 79 9938		510									
H 79 9844										700	
H 79 9963				1027							
R 79 3242										425	
R 79 3268		450									
R 79 3441		400									
R 79 3445						30					
T 79 5024				205							
T 79 5082		440									
1 80 7183		155									
1 80 7292										150	
5 80 3961										605	
5 80 4322						515					
5 80 6736	290										
6 80 7928									113		
6 80 7949					155						
6 80 7963					303						
6 80 8034						84					

TECHNOLOGY AREAS
SUMMARY
(cont'd)

PROJECT	THRUST AREA (\$000)										
	100	200	300	400	500	600	700	800	900	1000	1100
F 80 3036				140							
H 80 3010						900					
R 80 1018		380									
R 80 3281						250					
R 80 3445						400					
T 80 5082		880									
1 81 7175										275	
1 81 7183		300									
1 81 7248						540					
5 81 6716								150			
6 81 7724					224						
6 81 7807		126									
6 81 7928									287		
6 81 8120					225						
6 81 8135						750					
6 81 8136								80			
6 81 8154						337					
6 81 8226						187					
F 81 3005				115							
F 81 3036				2000							
H 81 9845		518									
R 81 3281						250					
T 81 5024				350							
T 81 5082		880									
T 81 5086		255									
T 81 5091		420									
T 81 6008		250									
T 81 6053						350					
TOTAL											
Number	2	17	1	6	7	13	-	4	2	8	1
Dollar	546	7132	282	3837	1305	5473	-	706	400	2596	171

TECHNOLOGY AREAS
SUMMARY
BY FISCAL YEARS

FISCAL YEAR	THRUST AREA (\$000)											
	100	200	300	400	500	600	700	800	900	1000	1100	TOTAL
79	256	2968	282	1232	398	910	---	476	---	1566	171	8259
80	290	1415	---	140	458	2149	---	---	113	755	---	5320
81	---	2749	---	2465	449	2414	---	230	287	275	---	8869
TOTAL	546	7132	282	3837	1305	5473	---	706	400	2596	171	22448

APPENDIX C
PROJECT INDEX

INDEX OF PROJECTS

by

MAJOR SUBORDINATE SUBCOMMANDS

<u>Command</u>	<u>Project Number</u>	<u>Page</u>
AVRADCOM	1 81 7175	26
AVRADCOM	1 79 7183	4
AVRADCOM	1 80 7183	13
AVRADCOM	1 81 7183	19
AVRADCOM	1 81 7248	22
AVRADCOM	1 79 7292	10
AVRADCOM	1 80 7292	17
ARRCOM/ARRADCOM		
Ammunition	5 79 3961	10
Ammunition	5 80 3961	17
Ammunition	5 79 4124	4
Ammunition	5 79 4322	8
Ammunition	5 80 4322	15
Ammunition	5 79 6682	9
Ammunition	5 79 6693	11
Ammunition	5 79 6716	9
Ammunition	5 81 6716	25
Ammunition	5 79 6736	4
Ammunition	5 80 6736	13
Weapons	6 79 7724	7
Weapons	6 81 7724	22
Weapons	6 79 7802	6
Weapons	6 79 7807	5
Weapons	6 81 7807	19
Weapons	6 80 7928	17
Weapons	6 81 7928	25
Weapons	6 79 7949	8
Weapons	6 80 7949	14
Weapons	6 79 7963	8
Weapons	6 80 7963	15
Weapons	6 79 8025	10
Weapons	6 80 8034	15
Weapons	6 81 8120	23
Weapons	6 81 8135	23
Weapons	6 81 8136	25
Weapons	6 81 8154	23
Weapons	6 81 8226	24
CORADCOM	F 81 3005	21
CORADCOM	F 80 3036	14
CORADCOM	F 81 3036	21
CORADCOM	F 79 9938	5

<u>Command</u>	<u>Project Number</u>	<u>Page</u>
ERADCOM	H 80 3010	16
ERADCOM	H 79 9844	11
ERADCOM	H 81 9845	19
ERADCOM	H 79 9963	7
MICOM	R 80 1018	13
MICOM	R 79 3242	11
MICOM	R 79 3268	5
MICOM	R 80 3281	16
MICOM	R 81 3281	24
MICOM	R 79 3441	6
MICOM	R 79 3445	9
MICOM	R 80 3445	16
TARADCOM	T 79 5024	7
TARADCOM	T 81 5024	22
TARADCOM	T 79 5082	6
TARADCOM	T 80 5082	14
TARADCOM	T 81 5082	20
TARADCOM	T 81 5086	20
TARADCOM	T 81 5091	20
TARADCOM	T 81 6008	21
TARADCOM	T 81 6053	24

APPENDIX D
DISTRIBUTION LIST

DRXIB-MT

DISTRIBUTION LIST

12 Defense Documentation Center, Alexandria, VA 22314

Department of Defense:

- 1 Cdr, DIRSO, Cameron Station, Attn: Mr. Charles Downer
- 1 Cdr, OUSD (R&D), The Pentagon, Attn: Dr. Lloyd L. Lehn

Department of the Army

- 1 HQDA, OASARDA, The Pentagon, Attn: Mr. Eugene S. Davidson
- 1 HQDA, ODCSRDA, The Pentagon, Attn: DAMA-PPM-P, Mr. Rod Vawter

HQ DARCOM

- 1 Cdr, DARCOM, Attn: DRCPP-I
- 1 Cdr, DARCOM, Attn: DRCMT, Mr. Fred Michel

Major Subordinate Commands

- 1 Cdr, Army Management Engineering Training Agency, Attn: DRXOM-SE, Mr. Al Takemoto
- 1 Cdr, Army Materials & Mechanics Research Center, Attn: DRXMR-ER, Mr. Roger Gagne
- 1 Cdr, Army Armament R&D Command (ARRADCOM) Attn: DRDAR-TSF-P, Mr. Stan Hart
- 1 Cdr, Army Armament Materiel Readiness Command Attn: DRSAR-IR, Mr. Augie Zahatko
- 1 Cdr, Army Aviation R&D Command, Attn: DRDAV-EXT, Mr. Dan Haugan
- 1 Cdr, Army Communications & Electronics Materiel Readiness Cmd, Attn: DRSEL-LE-RI, Mr. Joe Endros
- 1 Cdr, Army Communications R&D Command (CORADCOM) Attn: DRDCO-AM, Mr. Dave Ruppe
- 1 Cdr, Army Depot System Command (DESCOM), Attn: DRSDS-SI, Mr. Harry Dell
- 1 Cdr, Army Electronics R&D Command (ERADCOM), Attn: DELEW-PE, Mr. James Kelly
- 1 Cdr, Army Mobility Equipment R&D Command (MERADCOM), Attn: DRDME-DE, Mr. Bernie Bretz
- 1 Cdr, Army Missile R&D Command (MICOM), Attn: DRSMI-EAT, Mr. Rich Kotler
- 1 Cdr, Army Natick R&D Command (NARADCOM), Attn: DRDNA-EM, Mr. Irv Tarlow
- 1 Cdr, PM for Production Base Modernization & Expansion, Attn: DRCPM-PBM-I, Mr. Darrel Vegh
- 1 Cdr, Army Tank-Automotive R&D Command (TARADCOM), Attn: DRDTA-RP, Mr. Sam Goodman
- 1 Cdr, Army Tank-Automotive Materiel Readiness Command (TARCOM), Attn: DRSTA-ICC, Mr. Dan Urso
- 1 Cdr, Army Troop Support & Aviation Command (TSARCOM), Attn: DRSTS-PLE, Mr. Jim Corwin

Arsenals:

- 1 Cdr, RIA, Attn: SARRI-EN, Mr. Joe DiBenedetto
- 1 Cdr, RIA, Attn: SARRI-PM, Mr. John Wilkins
- 1 Cdr, Watervliet Arsenal, Attn: DRDAR/LCB, Mr. Harold Goodheim
- 1 Cdr, Watervliet Arsenal, Attn: SARWV-ODP-S, Mr. Don Ippolito
- 1 Cdr, Watervliet Arsenal, Attn: SARWV-PPI, Mr. L. A. Jette

Army Ammunition Plants:

- 1 Cdr, Crane AAP, Attn: SARCN
- 1 Cdr, Hawthorne AAP, Attn: SARHW
- 1 Cdr, Holston AAP, Attn: SARHO
- 1 Cdr, Indiana AAP, Attn: SARIO-EN, Mr. Gary McGloskey
- 1 Cdr, Iowa AAP, Attn: SARIO-EN, Mr. George Mathes
- 1 Cdr, Kansas AAP, Attn: SARKA

Army Ammunition Plants (cont'd)

- 1 Cdr, Lake City AAP, Attn: SARLC
- 1 Cdr, Lone Star AAP, Attn: SARLS-EN, Mr. Larry Henry
- 1 Cdr, Longhorn AAP, Attn: SARLO
- 1 Cdr, Louisiana AAP, Attn: SARLA
- 1 Cdr, McAlester AAP, Attn: SARMC
- 1 Cdr, Milan AAP, Attn: SARMI
- 1 Cdr, Mississippi AAP, Attn: SARMS
- 1 Cdr, Radford AAP, Attn: SARRA-XC, John Horuath
- 1 Cdr, Riverbank AAP, Attn: SARRB, Don Keith
- 1 Cdr, Scranton AAP, Attn: SARSC-EN, William Hayes

Depots:

- 1 Cdr, Anniston Army Depot, Attn: SDSAN
- 1 Cdr, Corpus Christi Army Depot, Attn: SDSCC-MPI, Roy Oliver
- 1 Cdr, Letterkenny Army Depot, Attn: SDSLE-MN, Raymond Amicone
- 1 Cdr, New Cumberland Army Depot, Attn: SDSNC
- 1 Cdr, Red River Army Depot, Attn: SDSRR
- 1 Cdr, Sacramento Army Depot, Attn: SDSSA-C, Mr. Russ Harris
- 1 Cdr, Sharpe Army Depot, Attn: SDSSH
- 1 Cdr, Tobyhanna Army Depot, Attn: SDSTO-ME, Mr. Tony Trotta
- 1 Cdr, Tooele Army Depot, Attn: SESTE-MAG, Lee Williams